

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) An ultrasonic medical device comprising:

an ultrasonic probe comprising a proximal end, a distal end and a longitudinal axis therebetween;

a transducer creating a torsional vibration of the ultrasonic probe;

a coupling engaging the proximal end of the ultrasonic probe to a distal end of the transducer; and

an ultrasonic energy source engaged to the transducer that produces an ultrasonic energy,
wherein, during use, the ultrasonic energy source provides an electrical power to the transducer at a resonant frequency of the transducer by finding the resonant frequency of the transducer.

2. (Original) The ultrasonic medical device of claim 1 wherein the torsional vibration of the ultrasonic probe causes a rotation and counterrotation along the longitudinal axis of the ultrasonic probe.

3. (Original) The ultrasonic medical device of claim 1 wherein the torsional vibration of the ultrasonic probe is propagated in a forward direction and a reverse direction about a plurality of torsional nodes along a portion of the longitudinal axis of the ultrasonic probe.

4. (Original) The ultrasonic medical device of claim 1 wherein a portion of the longitudinal axis of the ultrasonic probe comprises a radially asymmetric cross section.

5. (Original) The ultrasonic medical device of claim 4 wherein cavitation occurs around the portion of the longitudinal axis of the ultrasonic probe comprising the radially asymmetric cross section to ablate a biological material.
6. (Original) The ultrasonic medical device of claim 1 wherein the torsional vibration of the ultrasonic probe produces a plurality of torsional nodes and a plurality of torsional anti-nodes along a portion of the longitudinal axis of the ultrasonic probe.
7. (Original) The ultrasonic medical device of claim 1 wherein a length of the longitudinal axis of the ultrasonic probe comprises an approximately rectangular shaped cross section.
8. (Original) The ultrasonic medical device of claim 1 wherein a length of the longitudinal axis of the ultrasonic probe comprises a spline shape.
9. (Original) The ultrasonic medical device of claim 1 wherein a plurality of projections extend from an outer surface along a length of the ultrasonic probe.
10. (Original) The ultrasonic medical device of claim 1 wherein a length of the longitudinal axis of the ultrasonic probe has a cross sectional shape selected from the group consisting of elliptical, star shaped, rectangular, oval, triangular, trapezoidal, circular with a flat spot and square.
11. (Original) The ultrasonic medical device of claim 1 wherein the torsional vibration generates acoustic energy in a medium surrounding the ultrasonic probe.
12. (Original) The ultrasonic medical device of claim 1 wherein the ultrasonic energy source delivers ultrasonic energy in a frequency range from about 10 kHz to about 100kHz.

13. (Cancelled).

14. (Original) The ultrasonic medical device of claim 1 wherein the ultrasonic probe supports the torsional vibration when flexed.

15. (Original) The ultrasonic medical device of claim 1 wherein the ultrasonic probe has a flexibility allowing the ultrasonic probe to be deflected and articulated.

16. (Original) The ultrasonic medical device of claim 1 wherein the ultrasonic probe comprises a substantially uniform cross section from the proximal end of the ultrasonic probe to the distal end of the ultrasonic probe.

17. (Original) The ultrasonic medical device of claim 1 wherein the ultrasonic probe comprises a varying cross section from the proximal end of the ultrasonic probe to the distal end of the ultrasonic probe.

18. (Original) The ultrasonic medical device of claim 1 wherein the ultrasonic probe is disposable.

19. (Currently Amended) A medical device comprising:

an elongated probe comprising a proximal end, a distal end, and a longitudinal axis between the proximal end and the distal end wherein a portion of the longitudinal axis comprises a radially asymmetric cross section;

a transducer that converts electrical energy into mechanical energy, creating a torsional vibration along the longitudinal axis of the elongated probe;

a coupling engaging the proximal end of the elongated probe to a distal end of the transducer; and

an ultrasonic energy source engaged to the transducer that provides the electrical energy to the transducer,

wherein the torsional vibration along the elongated probe produces a plurality of torsional nodes and a plurality of torsional anti-nodes along a portion of the longitudinal axis of the elongated probe, and

wherein, during use, the ultrasonic energy source provides an electrical power to the transducer at a resonant frequency of the transducer by finding the resonant frequency of the transducer.

20. (Original) The medical device of claim 19 wherein the torsional vibration of the elongated probe produces a rotation and a counterrotation along the longitudinal axis of the elongated probe.

21. (Original) The medical device of claim 19 wherein the torsional vibration of the elongated probe is propagated in a forward direction and a reverse direction about the plurality of torsional nodes of the elongated probe.

22. (Original) The medical device of claim 19 wherein the torsional vibration generates acoustic energy in a medium surrounding the elongated probe.

23. (Original) The medical device of claim 19 wherein cavitation occurs over an active area of the elongated probe along the portion of the longitudinal axis comprising the radially asymmetric cross section.

24. (Original) The medical device of claim 29 wherein a length of the longitudinal axis of the elongated probe comprises a spline shape.

25. (Original) The medical device of claim 19 wherein a length of the longitudinal axis of the elongated probe has a cross sectional shape selected from the group consisting of elliptical, star shaped, rectangular, oval, triangular, trapezoidal, circular with a flat spot and square.

26. (Original) The medical device of claim 19 wherein a plurality of projections extend from an outer surface along a length of the elongated probe.

27. (Original) The medical device of claim 19 wherein the ultrasonic energy source delivers ultrasonic energy in a frequency range from about 10 kHz to about 100 kHz.

28. (Cancelled).

29. (Original) The medical device of claim 19 wherein the elongated probe supports the torsional vibration when flexed.

30. (Original) The medical device of claim 19 wherein the elongated probe has a flexibility allowing the elongated probe to be deflected and articulated.

31. (Original) The medical device of claim 19 wherein the elongated probe comprises a substantially uniform cross section from the proximal end of the elongated probe to the distal end of the elongated probe.

32. (Original) The medical device of claim 19 wherein the elongated probe comprises a varying cross section from the proximal end of the elongated probe to the distal end of the elongated probe.

33 – 63. (Canceled).

64. (Currently Amended) An ultrasonic probe comprising:

a proximal end;
a distal end that terminates in a probe tip; and
a longitudinal axis between the proximal end and the distal end, a portion of the longitudinal axis of the ultrasonic probe comprising a radially asymmetric cross section to support a torsional vibration,

wherein, during use, the ultrasonic energy source provides an electrical power to the transducer at a resonant frequency of the transducer by finding the resonant frequency of the transducer.

65. (Original) The ultrasonic probe of claim 64 wherein the ultrasonic probe comprises a varying cross section from the proximal end of the ultrasonic probe to the distal end of the ultrasonic probe.

66. (Original) The ultrasonic probe of claim 64 wherein a cross section of the proximal end of the ultrasonic probe is approximately circular.

67. (Original) The ultrasonic probe of claim 64 wherein the radially asymmetric cross section comprises a spline shape.

68. (Original) The ultrasonic probe of claim 64 wherein the radially asymmetric cross section has a cross sectional shape selected from the group consisting of elliptical, star shaped, rectangular, oval, triangular, trapezoidal, circular with a flat spot and square.

69. (Previously Presented) The ultrasonic probe of claim 64 wherein the ultrasonic probe comprises a varying diameter from the proximal end of the ultrasonic probe to the distal end of the ultrasonic probe.

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70. (Original) The ultrasonic probe of claim 64 wherein the ultrasonic probe has a flexibility allowing the ultrasonic probe to be deflected and articulated.

71. (Canceled).